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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

May 22, 1937

Hidden Beauty Revealed

See Page 330

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DO YOU KNOW?

At least 13 kinds of mosquitoes in India carry malaria.

Goldfish are often used as "guinea-pigs" in tests for stream pollution.

Sunspots were discovered in 1610, not long after telescopes were invented.

Recipes for making cheese dating back to the first century A. D. are still in existence.

Every home built in Italy since December 1936 must have an anti-gas shelter in the basement.

It took Egyptians ten years to build the road for hauling materials to the site for the Great Pyramid.

A 2,000-word dictionary of an extinct language called Khorezmian has been compiled by a Soviet scientist in Astrakhan.

Discarded airplane tubing is found valuable in making braces for hospital patients, because of its lightness and strength.

Musical instruments played by Apache Indians included drum, musical bow, flageolet, and one-stringed fiddle made of a flower stalk of the sotol plant.

Flowers keep better if cut with a sharp knife than with scissors.

Use of nickel, chromium and cobalt in ornamental plating is prohibited in Germany.

The name scientist, to describe a man of science, was coined only about a century ago.

The life of a milk bottle is now 30 to 35 trips, in contrast to 22 trips some years ago.

Amber is not affected by moisture, a fact which makes it useful in apparatus for blood transfusions.

One of the penalties of being overweight—90 per cent. of obese people have trouble with their feet.

Automobile drivers travel faster in winter than in spring or summer, a survey in Connecticut indicates.

Ants are long-lived insects, workers being known to survive four or five years and queens to live as long as 15 years.

The Philosopher's Stone, that alchemists believed would heal the sick and make old people young, also was supposed to hasten growth of plants.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

AERONAUTICS

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ARCHAEOLOGY

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PSYCHOLOGY

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SAFETY ENGINEERING

How can explosions of toy balloons be prevented? p. 328.

PSYCHIATRY

Insulin Promises Cure For Common Mental Disease

Treatment Used in Vienna and Confirmed by Trials In United States Gives New Hope to Thousands

INSULIN, the gland extract that makes life possible for thousands of persons suffering from diabetes, now promises to save other thousands from the living death of insanity.

The accidental discovery of the effect of this gland extract on the clouded minds of narcotic drug addicts and sufferers from schizophrenia (split-mind), wide-spread mental disease, was described by Dr. Manfred Sakel of Vienna, Austria, at the meeting of the American Psychiatric Association in Pittsburgh, Pa. This treatment is being hailed as almost the first promising weapon of attack on this centuries-old mental disease.

A morphine addict in a Vienna hospital, the story goes, was found to be suffering from diabetes. He was given insulin for this condition. As sometimes happens with insulin treatment, he had an "insulin shock," a state the reverse of diabetes in which the body uses up sugar too fast and the amount of sugar in the blood falls below normal level. Much to the doctor's surprise, when this patient recovered from the insulin shock, his mental condition was greatly improved.

Other patients, who had no diabetes but were suffering either from drug addiction or from mental disease, were then given large doses of insulin, to induce shock. In many of these, the mental condition also improved, apparently permanently.

Confirmation

Similar experiences with the use of this new treatment for schizophrenia were reported by these American psychiatrists: Drs. Solomon Katzenelbogen, Herbert Harms and Dean A. Clarck of Henry Phipps Psychiatric Clinic, Baltimore, and Spring Grove State Hospital, Md.; Drs. Joseph Wortis, Karl M. Bowman and Leo Orenstein of Bellevue Hospital, New York; and Drs. G. Alexander Young, Richard H. Young and Louis G. Roucek of Omaha.

From a third to half the patients treated by this method showed improvement in their mental state which appears to be permanent, although the treatment is so new that it is not yet possible to say how long the improvement will last. In some cases it has lasted for three years.

The psychiatrists seem agreed that the treatment is most successful in acute cases of schizophrenia in which the patients are young and have not been ill very long. Chronic cases do not seem to respond as well to the treatment.

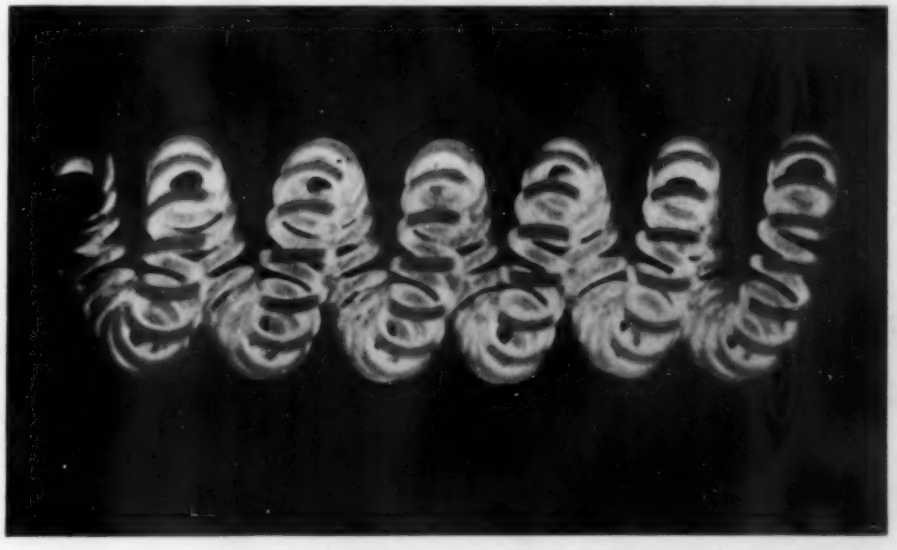
The treatment is not without danger. Insulin shock brings on hypoglycemia, a grave condition in which there is less than normal sugar in the blood. This condition occurs spontaneously in some persons who show symptoms that may be mistaken for mental disease, Drs. Edwin J. Kepler and Frederick P. Moersch of the Mayo Clinic reported. Hypoglycemia leads rapidly to death, unless the sugar lack is promptly remedied. This may be done by injecting sugar into the veins or giving the patient sugar water to drink.

When insulin shock is induced to treat mental disease, the resulting hypoglycemia or sugar lack is checked by giving sugar. The danger of this new mental disease treatment is that the sugar may not be given soon enough. The Omaha physicians reported two deaths and two other cases which nearly ended fatally in spite of efforts to bring the sugar level back to normal following the shock.

How or why insulin shock restores the sanity of the patients is still an unsolved mystery. It may be that the shock itself jolts the mind back to normal, or it may be that the temporary change in the sugar level restores the body's intricate chemical processes to normal. Since no one knows what causes schizophrenia, no one can yet say why the treatment remedies the condition in certain cases. But the treatment itself may give a clue that will lead to solution of the cause of the disease. That in turn should lead to even greater success with the treatment since it will show how the treatment can be modified and made specific— a "sure cure," perhaps.

Large Group

Schizophrenia is the term covering a large group of mental diseases or psychoses. It is also known as dementia praecox. The fundamental basis of personality consists of a person's mood and emotions. Unity and harmony of emotions and association of ideas is so usual that it is almost inconceivable that there should be any lack of such agreement. But this sort of mental disease is charac-



COIL AND RECOIL

This is how the coil in a new incandescent lamp looks when it is magnified. Recoiling the coil on itself is said to reduce the amount of wattage drained away by the gas in the bulb and increase the amount available for light.

terized by a disorder of feeling and thinking and a consequent disturbance of the patient's relations to the outer world. It is this state which insulin gives great promise of remedying.

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MEDICINE

Sudden Deaths of Mothers Is Price Paid for Less Pain

Deep Amnesia and Analgesia Give Relief But Result In Later Bleeding and Shock With Drugging of Baby

THE PAINS of childbirth—are they to be bravely endured or humanely prevented?

This question, perennial in medical circles and among childbearing women, claims the leading position in a current issue of the *Journal of the American Medical Association* (May 15).

Dr. Thaddeus L. Montgomery of Philadelphia reports a five-year study of the number and nature of anesthetic deaths made from the records of the maternal welfare committee of the Philadelphia County Medical Society.

Except for the deaths that occur during labor or within twenty-four hours afterward, the maternal death rate has gone steadily down during the five-year period.

But the physician's share in responsibility for sudden death in and after labor has increased more than 100 per cent., Dr. Montgomery finds. Mistakes in judgment and errors in technique account for this, he believes.

"Apparently something is wrong with methods and management in labor," Dr. Montgomery declares, "and, saddest to relate, whatever is wrong is going more astray with each succeeding year."

Deep Amnesia Blamed

Deep amnesia and deep analgesia—the method used for lessening the pangs of childbirth—are responsible for this bad showing of current obstetric practice, this doctor finds after reviewing some 155,000 cases of live births, 1,096 of which resulted in the death of the mother.

Women must be prepared to accept a moderate and safe degree of analgesia. If they will accept this, they will pass through delivery in better condition than the mother who is "drugged to an unconscious state and whose labor becomes a blank chapter in her life," this obstetrician states.

"The accoucheur seems often so bent on getting his patient asleep and her baby delivered that he gives little thought to the outcome of his hasty procedures," Dr. Montgomery charges.

When the birth of the child is accomplished, he is abruptly confronted with results. The analgesic agent that gave the mother such profound rest has narcotized the baby.

The material that brought the mother forgetfulness of her experience combines with the third stage bleeding to produce obstetric shock.

The anesthetic that made operative delivery convenient has relaxed the uterus and caused bleeding.

The situation then calls for real generalship, and if it is not forthcoming, the mother dies.

What answer shall the doctor give the prospective mother who wants first to know whether the pangs of labor will be eliminated?

This is what Dr. Montgomery would tell her:

1. That he sympathizes with her desire for relief and is familiar with and uses in every labor various methods of attaining that end.

2. That he must select at the time of labor the drugs that seem best adapted to her condition, as what is best for Mrs. Smith is not always best for Mrs. Jones.

3. That her safety and the safety of the child are paramount issues and that with these thoughts uppermost she will be attended closely during the critical period of labor.

On the basis of this study, spinal anesthesia is condemned as a method of obstetric practice. Furthermore, Dr. Montgomery finds that the use of barbituric acid derivatives are not as free of danger as many reports would indicate.

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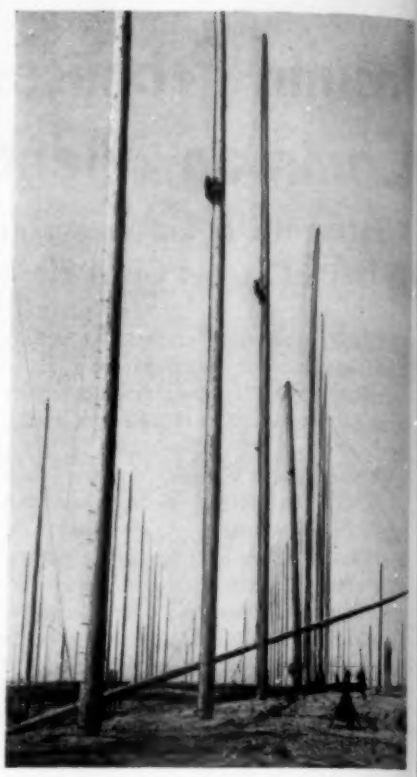
Balloons first proved useful in war in 1794, when a French officer gave signals from the air and thus helped win a victory over the Austrians.



MASTS

Towering to a height of 130 feet are these giant wooden masts which will support antenna for the improved trans-Atlantic radio communication. Workmen on the poles at Riverhead, Long Island, give a size comparison. The masts were shipped as deck cargo by steamer from the West Coast.

ARCHAEOLOGY

No Secret to Pyramids Says German Professor

NO USE trying to read mystic secrets from Egypt's pyramids by numerology or any other theories.

The pyramids have no secret, is the emphatic view of a German Egyptologist, Dr. Georg Steindorff, professor emeritus of Egyptology, University of Leipzig, who is giving a series of lectures at the Oriental Institute of the University of Chicago.

Egypt's pyramids were simply royal tombs, and evolution of the pyramid form from flat-topped tombs is well understood, Dr. Steindorff explained. Yet popular notions persist that the pyramids had mathematical or astronomical significance. The most popular theory, the German Egyptologist said, assumes that the Egyptians knew the relation of the circle to its circumference, that is, the value of pi. However, they had no such knowledge in the pyramid era.

Science News Letter, May 22, 1937

PSYCHIATRY

Heaven is Called a Dream Based on Childhood Memories

Psychiatrists Are Told of Need for Peace Department; Danger in Sleeping Drugs; Love a Personality Vitamin

HEAVEN is a dream that grown men and women build for themselves out of faint memories of their babyhood.

Dr. Gregory Zilboorg of New York gave this scientific definition of heaven to the American Psychiatric Association.

The baby in his cradle is loved and admired by everyone, fed, and made comfortable in every way without any effort on his part. This happy state is the one to which everyone unconsciously wants to return.

Adults may not picture heaven as a literal state of babyhood, but they do see it as a place where, free from worry and turmoil, from wars, strikes, competition and hostile people, they can be as happy and peaceful as babes in the cradle. Even atheists and others who do not believe in a literal heaven substitute for theological immortality their faith in a bigger and better future for humanity.

Another sign of this unconscious desire to return to blissful state of babyhood is the average man's desire to succeed in business so that he "can retire and live at last," Dr. Zilboorg pointed out. In this dream a 12 cylinder Packard car, Dr. Zilboorg said, represents the bottle of carefully prepared milk formula in the baby's mouth.

This constant desire to return to an earlier stage of life and repeat past experiences, no matter how modified, is one of the outstanding characteristics of man's nature. Psychiatrists call it compulsive repetition and compare it to the return of the seasons, the annual blooming of flowers and other repetitions in nature.

Idealized

"The sense of immortality," Dr. Zilboorg said, "is an attempt to repeat in fantasy the idealized childhood in an adult setting, where the Father in Heaven and Mother Earth make a perfect alliance to care for the idealized infantile life."

The idea of immortality arose from the fact that man cannot believe that he can die and yet is threatened with death every minute. The only way out of this conflict is in the fantasy of immortality, whether it is a literal heaven or a belief in the future of humanity.

Man's inability to imagine his own death was recognized by the Austrian psychiatrist, Freud. A person may see himself lying dead in his coffin, but actually all the time he is alive, standing off looking at the image of his death. He never actually can feel dead. Dr. Zilboorg suggested that any who do not realize the truth of this should try to imagine their own deaths.

The sense of immortality is at the base of most modern and primitive suicides, Dr. Zilboorg declared. There are various types of suicide, but in most cases man kills himself in order, paradoxically, to live forever. He takes his life in order to prove himself master of it and thus become like God, eternal.

This is the reason why all monotheistic religions, Judaism, Christianity and Mohammedanism, regard suicide as a sin, because by killing himself man is taking on the role of God, which these religions forbid.

Need Peace Departments

Peace departments, not war departments, are the great need of nations today.

This was the suggestion of Dr. C. Macfie Campbell of Harvard University in his presidential address.

We have departments of health, not of disease; departments of education, not of ignorance, he pointed out. But when leading psychiatrists of the world formally urged the nations to strive for peace, they had to address their letter to secretaries for war.

Peace between nations, between labor and industry, and even peace between husbands and wives or other relatives depends, Dr. Campbell said, on each person's knowing and understanding himself and his own needs.

Man craves a certain status or prestige or self-respect, Dr. Campbell explained in defining these needs. Men and women are not content to be pawns. They need also an opportunity to exercise skill or power or some form of self-expression.

When these needs are not filled, the individual man or woman is dissatisfied, and when this dissatisfaction is multiplied millions of times, it shows itself in conflict between labor and industry and between nations.

Peace, like charity, should begin at home, Dr. Campbell said. Peace of mind for the individual must be attained before there can be hope of peace between nations. The human soul is an arena of combat between appetites and ideals, between childish and mature desires, between reaction and progress. If psychiatrists can make peace begin at home by teaching each how to find peace of mind and how to live peacefully with his relatives and neighbors, whole nations will be able to get along on a frank and honest basis of good will and cooperation.

Sleeping Potions

The use of sleeping medicines, such as bromides, and veronal, amytal and others of the barbiturate type, is apparently leading to a definite increase in mental disease, Dr. Frank J. Curran, of Bellevue Hospital, New York, declared.

The barbiturates are sold in most states without restriction. Dr. Curran urged the association to secure legislation restricting the sale of these drugs, which he termed habit-forming.

"These drugs," he said, "are cumulative in the body, producing mental symptoms of such a degree that admission to a mental hospital becomes necessary."

A study of 50 such patients showed that the types who use barbiturates over a long period are the chronic alcoholics, persons suffering from mental disease and those suffering from the type of nervous illness labelled psychoneurosis.

Large single doses of these drugs are usually taken with suicidal intent by mentally sick persons. Dr. Curran reported that one patient had used barbiturates daily for 16 years.

Addiction Declining

Narcotic drug addiction is apparently declining as a result of measures controlling the sale of narcotic drugs, Drs. Lawrence Kolb and C. K. Himmelsbach of the U. S. Public Health Service found.

Many of the addicts who come for treatment at the present time have weak habits or are already partly cured. Only

about one-fifth of the addicts have really strong habits when they come for treatment.

Patients with weak drug habits should be treated, the federal health service doctors advised, by withdrawing the narcotic drug abruptly. Mild measures such as sedatives and special baths are usually sufficient to relieve the withdrawal symptoms in these cases. Abrupt withdrawal in severe addiction, however, was strongly censured by Drs. Kolb and Himmelsbach.

"For addicts with strong habits," they declared, "abrupt withdrawal is cruel, dangerous and unnecessary.

"Such treatment is often given in prisons and sometimes in hospitals because of a feeling that the addict does not deserve anything better. This, of course, goes along with a general hostile attitude towards the addict that is bad psychologically and lays the groundwork for relapse."

Withdrawal therapy, that is, depriving the addict of the narcotic he has been taking, is all that is necessary in curing patients with a normal nervous makeup, and is a very simple matter in these cases. In the case of drug addicts who are emotionally unstable, withdrawal is the most unimportant part of the treatment. These patients, if they are to be cured, must be rehabilitated mentally and emotionally. The nervous or emotional disturbance that originally led to their taking the drug and forming the drug habit is more important than the addicts' physical dependence on the drug. This is the factor which, if untreated, leads to relapses after withdrawal treatment.

Personality Vitamin

Children starved by lack of mother love grow up with stunted emotions and personality, just as children starved by lack of some essential food elements are stunted in physical growth, Dr. David M. Levy of New York has observed. Such a child is never able to display real affection for others.

The element of mother love may be considered as a vitamin necessary for the development of normal personality. This mother love vitamin is not the same as maternal care. Looking after a child's physical needs and teaching him is not enough, and the physically and mentally well cared-for child who is deprived of his mother's affection is starved in much the same way that a child may be starved on three hearty meals a day if the meals do not contain vitamins and other minute but essential food elements.

This finding leads to a tip for persons considering the adoption of children. Children should be adopted, Dr. Levy advised, either before they are a year old or after they have passed the infantile period.

Diet For Epilepsy

Putting epileptics on a diet rich in fats and with little sugar or starch foods prevented attacks of the disease in nearly half of a group of patients, reported Drs. Henry F. Helmholz and Moe Goldstein of the Mayo Clinc. Their report, based on 15 years experience with the diet, shows that it is fulfilling the hope held when it was first adopted as a method of treating epilepsy.

Blue Dye

Injections into the veins of a blue dye, methylene blue, for the treatment of a convulsive malady was recommended by Dr. Laslo Kajdi, of the Johns Hopkins Medical School, and Dr. C. V. Tayler of Springfield State Hospital. The physicians used it in cases of a disease called status convulsivus, in which series of convulsions follow one after another. In over half the cases the attacks ceased after injection of the dye, consciousness returned and confusion did not follow. The two physicians said that this was the only treatment for the condition so far as they knew which would bring the patients immediately back to consciousness. They tried it on the theory that the condition might be due to lack of oxygen.

Cause of Obsessions

Changes in the brain structure itself are responsible for obsessions, Dr. Paul Schilder of New York told members of the American Psychiatric Association.

The kind of obsessions to which Dr. Schilder referred are a form of mental disorder in which certain thoughts and ideas keep going through the patient's mind against his wish and in spite of himself.

One patient cited by Dr. Schilder got the idea, from her sister's criticism, that she had always been lazy. She resented this very much, but could not stop thinking and saying that she had always been lazy. Her husband tried to help her overcome this difficulty which worried her by telling her "to send the cockeyed world to hell." After that, she could not get out of her mind the idea that she had to do this.

Another patient complained of seeing dirt everywhere and had to clean her house continually, although she was convinced that there was no dirt in it. These patients are not really thinking, Dr. Schilder explained, but are in a state in which one idea persists in their minds.

The patient who was obsessed with the idea of dirt had had encephalitis. The other patient had not, but must have also had some damage to her brain, Dr. Schilder believes. Such patients, like those who have had encephalitis, show other symptoms of brain damage. Important among these symptoms, he said, are a slight rigidity of the face and faintly mask-like appearance; slight rigidity of the elbows; great urge to talk; and overactivity.

The brain damage may have been present at birth or may have been caused by injury at birth or by some unknown poison or infection. It probably occurred during early childhood. This would account for the infantile attitude toward sex shown by these patients.

Psychiatric treatment was successful in all but one of the seven cases reported.

Birth-Injured

A remarkable case of a boy whose brain was so badly injured at birth that he could not sit up alone and could never talk but who was able to read, to do simple lessons and before his death at the age of 14 showed signs of growing up, was reported by Dr. Arnold Gesell of Yale University School of Medicine.

This lad's case showed that these birth-injured children, of whom there are thousands in the country, are not all feebleminded. The injury to the brain prevents their having any motor control. They cannot move arms or legs or hands, in most cases, and when they try to do so, their whole bodies jerk and move in a senseless manner which with other symptoms gives the appearance of feeblemindedness.

Many of these children are unaffected mentally and can be trained both mentally and, in some cases, physically. From the standpoint of treatment the chief problem, Dr. Gesell said, is to appraise correctly and to release the patient's potentialities for self-directed effort.

Classified by Blood Studies

Acute insanity may be distinguished from chronic insanity by certain properties of the blood, Dr. S. DeWitt Ludlum of Philadelphia reported. He classi-

fied mental diseases in four groups according to the protein composition of the blood.

No change in blood proteins was found in normal persons, chronic demented patients who had probably reached a new state of physical and chemical equilibrium, hysterical patients and those suffering from neurotic disorders.

An increase in a protein called euglobulin was found in patients suffering from mental disease due to some poison. The symptoms are probably due to disturbance in the interchange of water between blood and tissues.

Pseudoglobulin, another kind of protein, was increased in the intoxications due to a specific poison acting on a susceptible organ.

Albumin was increased in patients of a non-reactive type. This increase in albumin shows the presence of physiological deficiency of some sort.

Pig Has Nervous Breakdown

Cases of nervous breakdown in sheep and pigs were reported by Dr. H. S. Liddell of Cornell University Medical College.

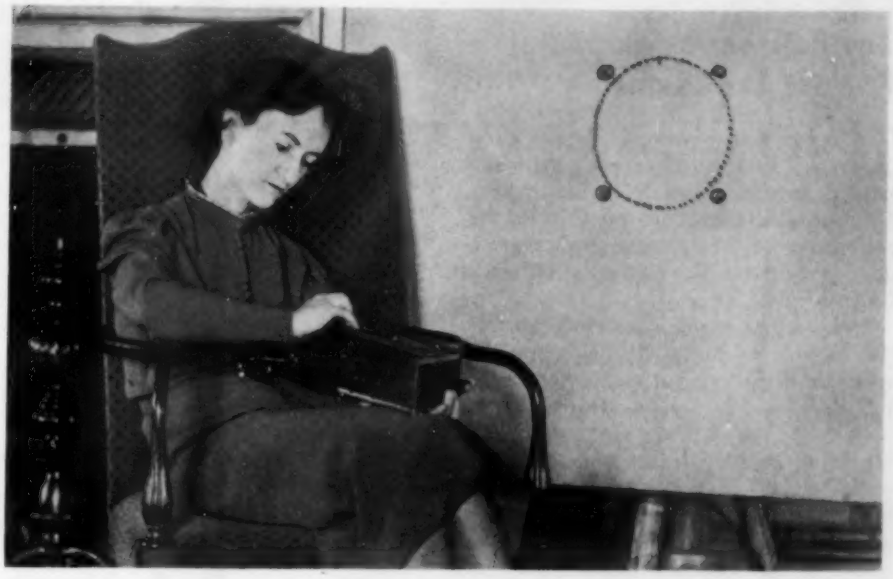
The nervous breakdown was produced experimentally in the animals and is important because it gives psychiatrists for the first time "guinea pigs" on which to test treatments for mental disease before trying them on human patients.

Out of a group of sheep which had been trained to take part in certain laboratory experiments, three suddenly became neurotic and refused to be led to the laboratory. Like a neurotic person, these animals developed tics, irregular breathing and rapid heart beats.

The pig had been trained to open the lid of a box to get an apple which was delivered at certain signals but not at others. Later a slight shock was given when the pig opened the lid of the box, but the animal paid no attention to this.

Then the signals were made more complicated. One kind of shock was given on feeding day and another kind on other days. Soon the animal resisted efforts to give the shock but remained quiet on feeding days. The pig continued to open the lid of the box to get the apple, but when its attempts to do this were met with another shock, it refused to open the lid until a piece of apple was dropped.

Finally the experimenter refused to drop the apple until (*Turn to Page 332*)



THE OSCILLION

Seated in an easy armchair is Mrs. William E. Danforth playing the electrical musical instrument developed by her scientific husband, Dr. W. E. Danforth, for use in the non-paid Swarthmore Symphony Orchestra. By sliding the finger on the strips of metal atop the box the tones of the French horn or the bass clarinet issue from the loud speaker seen in the right background.

PHYSICS

Electric Instrument Invented To Take Place of French Horn

WHEN Dr. W. F. G. Swann, the well-known scientist who is director of the Bartol Research Foundation lifts his baton in his extra-curricular job as conductor of the non-paid Swarthmore (Pa.) Symphony Orchestra he can call into service two novel electrical musical instruments used nowhere else in the world.

Like most non-paid musical units the Swarthmore Orchestra finds difficulty in obtaining a full complement of instruments to render standard symphonic works.

But ingenuity, in the person of the Bartol scientist, Dr. William E. Danforth, has devised electrical apparatus that can pinch-hit for the missing French horn and bass clarinet. A simple elongated box that one holds on the left forearm and plays by moving the fingers on two metal strips does the trick, when linked to radio amplifying apparatus and a loud speaker.

Slight pressure of the right forefinger on one of the strips causes the loud speaker to give a tone controlled in a fashion similar to the fingering of a violin. The loudness of the tone produced is controlled by moving a small lever with the left thumb. The other fingers of the left hand control the range of pitch of the instrument.

Dr. Danforth explained to Science Service that while none of the principles used in the instrument are new to electrical science, certain features of design, ease of playing and "life" of the tone produced, are improved over what has previously been available.

Fundamental to the operation of the "oscillion," explained Dr. Danforth, is a gas discharge oscillator. When the finger is placed on the strip an electrical condenser starts charging up like a small water tank being filled through a pipe.

After a certain amount of electricity is stored up in this way the electricity is discharged through the gas discharge tube. This is as if someone suddenly pulled the bottom out of a water bucket and let the water fall all at once.

After the discharge, the condenser again begins to store (*Turn to Page 332*)

SAFETY ENGINEERING

Toy Balloons With Helium Prevent Explosions

TOY balloons endanger lives of children if they are filled with hydrogen gas. A careless cigarette or match near hydrogen-filled balloons may send the youngsters to the hospital. Each hydrogen-filled balloon is a miniature Hindenburg.

Helium, the safe, non-inflammable gas, is used by many toy balloon sellers to inflate their colorful wares that children so often cry for.

In some cities there are ordinances requiring the toy balloons to be filled with helium. Elsewhere those who sell them use this safe gas because hotels and other public places insist upon it to guard against the starting of fires and the causing of panic due to explosions.

Helium is commercially available for this purpose from one concern with headquarters in Kentucky and with helium producing plants in Colorado and Kansas. Helium costs more than hydrogen but the added cost is small compared with the protection that it affords.

Science News Letter, May 22, 1937

AGRICULTURE

Farm Ownership Expected To Aid in Erosion Fight

FARM tenancy brings soil erosion as one of the many evils in its train. Operator ownership is a powerful preventive of this menacing cancer of the land.

These tenets constitute a prominent part of the credo of the President's Committee on Farm Tenancy, whose report was recently made public. The fact that less than half the farmers of the United States now own all the land they work lends extra weight to these considerations.

It is not to be expected that tenants or share-croppers, especially those who hold the land for too-short periods at too-high rents, will do much toward conserving the soil. On the contrary, it is to their interest (indeed often a matter of desperate self-preservation) to wring all they can out of the soil that is not theirs and put as little as possible back. Skimp on fertilizer, plow even steep slopes for cash crops: that is the bad economy often enforced upon the short-term tenant.

Without impropriety the parable of the Good Shepherd might be paraphrased into agricultural language:

"But he that is a tenant or a share-cropper, whose own the land is not, seeth soil-ruin coming, and leaveth the land, and fleeth: and erosion taketh and ruineth the land.

"The tenant fleeth, because he is a tenant, and careth not for the land."

The good farmer, he who owns the land, may not go so far as to lay down his life for it, but he will at least take thought for his land, and bestow labor to stop gullies, and spare slopes to trees and grass. To the increase of such is the present effort of the Government directed.

Science News Letter, May 22, 1937

AERONAUTICS

Invention Might Prevent Disaster Like Hindenburg's

A NEW invention which eliminates the need of valving explosive hydrogen by an airship and which might well have prevented the tragic Hindenburg disaster has just been granted by the U. S. Patent Office, it is revealed in a search made by Science Service.

According to the patent of Wilhelm O. L. Fischer, of the Goodyear-Zeppelin Corporation of Akron, Ohio, the hydrogen, instead of being sent off into the air where it is a potential menace from explosion, is converted into harmless water that can be used for drinking, cooking and even as ballast for an airship.

In the airship proposed in Mr. Fischer's patent both hydrogen and helium gases are used to obtain buoyancy, with the hydrogen in relatively small bags completely surrounded by non-inflammable helium gas. The hydrogen bags are completely inflated as the airship is on the ground. The helium bags are only partially inflated to allow for the expansion of the gas which occurs as the airship rises.

The hydrogen gas expands too, on rising, but the excess is led off into a specially shielded burner where it is burned. In the burning it combines with oxygen and forms simple, pure water.

Beside the safety factor, other claims of the new patent are:

Less ballast needed, less fresh drinking water need be carried, and elimination of the necessity of condensing engine exhaust gases to compensate for the loss of fuel consumed on a flight. Mr. Fischer also outlines in his patent how the heat obtained from the burning hydrogen can create steam and be used to spin turbines and even the propellers of the airship. The Goodyear-Zeppelin Corporation now holds the patent through assignment.

Science News Letter, May 22, 1937

IN SCIE

PSYCHOLOGY

We Are All Either Yes-Men Or No-Men, Scientist Finds

LITTLE Mary wanted to go to the circus. Her mother forbade it on the ground that the father was unwilling.

"Yes," protested the wise ten-year-old. "I know just how you asked him. You said, 'You don't want her to go, do you?'"

Mary knew her father was a yes-man. He would agree with anything that Mother proposed. She probably had also noticed that the mother, on the contrary, was a "no-man." It was her habit to disagree, on general principles, with everything suggested to her.

It has become a custom now to think of Congress as a body of yes-men, and of the Supreme Court as a smaller group of no-men. But now psychologists have heard the surprising news that those who criticize are probably in the same boat themselves. The world appears to be made up of just two kinds of people —yes-men and no-men, with a small sprinkling of habitual hedgers.

Acting as a bombshell to explode previous attempts to measure personality, this conclusion was reached by Dr. Irving Lorge, of Teachers College, Columbia University, as a result of his study of 84 persons on a WPA project. If a person answers yes to the question, "Are you slow in making decisions?" he would very likely give an affirmative answer also to the query, "Are you interested in mathematics?" And not because of any relation between the questions, but merely because he likes to say yes. Another person will persistently answer no.

Interesting differences between the yes-men and the no-men have already been discovered by Dr. Lorge, and he plans further exploration along this line. Self-confidence appears to be enjoyed by the yes-men and denied to the no-men.

No-men also seem to be lacking in "sociability," but the yes-men do not appear to have a parallel abundance of whatever that takes.

No-men, Dr. Lorge finds, are more intelligent.

Science News Letter, May 22, 1937

FIELDS

ASTRONOMY

No Trace of Atmosphere On Planet Mercury

THE PLANET Mercury has no trace of atmosphere, observations of the recent transit of Mercury (the planet passing across the disk of the sun) made at Harvard's astronomical station at Bloemfontein, South Africa, indicate. A cable reporting fair observing conditions for the infrequently occurring transit was received by Dr. Harlow Shapley, director of Harvard College Observatory, from Dr. John S. Paraskevopoulos. There was no luminous arc around the planet, indicating no air.

Best astronomical evidence was that Mercury, like the moon, was completely without air, any that it may have had having escaped into space long, long ago. But the evidence for the lack on Mercury was less detailed than for the moon.

Aside from the lack of sufficient atmosphere, Mercury is too burning hot to support life. The surface temperature is from 570 to 660 degrees Fahrenheit, tin would melt; and the sun is 4½ times larger than we see it from the earth.

Science News Letter, May 22, 1937

MEDICINE

Old Diseases Were Acute; New Ones Are Chronic

MODERN civilization may be streamlined for speed, but the chief diseases of the modern world follow a different pace. They tend to be more insidious and more chronic than the maladies that threatened health and life a few centuries ago.

Pointing to this difference between old and new diseases, Lord Horder, eminent English physician, recently remarked that the person who lived in the Elizabethan age "was very alive today and very dead tomorrow."

Smallpox, plague or cholera came in swift and violent epidemic outbursts. Recovery or death was also swift—a matter of days or weeks at most. The patient suffering from one of the so-called modern diseases, on the other hand, lingers on for months and years.

Another difference between old and new diseases is that the old diseases were like attacks by an alien enemy, but now, Lord Horder says, "it looks as though our enemies have become the men of our own house."

For example, among the modern diseases are cancer, diabetes, other gland disorders, diseases of the heart and blood vessels including high and low blood pressure, and the milder forms of nervous and mental disorders such as neurasthenia. Some of these diseases are not strictly new. Cancer, high blood pressure, and even infantile paralysis, were known centuries ago. Their occurrence, however, was less frequent than it is today.

Something apparently has gone wrong with man's control over his own body, just as science was gaining control over the germ diseases. Lord Horder suggests that perhaps we are "discharging the battery at too high and charging it at too low an amperage."

The conquest of the old diseases has made life longer. Whether it is to be happier and healthier, or whether the extra years are to be wholly devoted to fighting the new, chronic diseases depends largely, Lord Horder suggests, on man himself.

Science News Letter, May 22, 1937

PALEONTOLOGY

Dinosaurs' Last Roundup To Be Explored

SCENE of the dinosaurs' last roundup, a series of hundred-million-year-old strata of Upper Cretaceous age discovered in Utah last summer by Government geologists, will be explored for remains of the fantastic giant reptiles this season by Charles W. Gilmore, Smithsonian Institution paleontologist.

It was in the Upper Cretaceous, Mr. Gilmore explained, that the dinosaurs, evolved into fantastic horned and armored forms, made their last stand against inevitable extinction. A hundred million years ago they ended the domination which they had exercised over the earth for almost that long, and made way for the coming of the Age of Mammals.

Practically all possble sites for good dinosaur digging have by now been discovered and staked out in scientific "claims," so that this newly reported area is something really noteworthy.

Science News Letter, May 22, 1937

ARCHAEOLOGY

Hymn Book Sheds Light On Medieval Music

NEW LIGHT on medieval music and art is shed by discovery of a great hymn book with 512 pages, used in the thirteenth century.

A Princeton University picture-taking expedition has found the extremely rare hymn book among Bibles and other literary treasures of Greek Orthodox monasteries on Mount Athos.

The great hymn book, known as a sticherarium, is written in Byzantine musical notation with Greek text, and is illustrated.

Importance of the book is that it traces Byzantine art and music to the famous eighth century theologian, John of Damascus. The manuscript book is a copy, very accurately made from earlier manuscript, according to Prof. Albert M. Friend, Jr., of Princeton's Department of Art and Archaeology.

"The pictures are plainly copies of early Palestinian originals," he reports, "of the period when John of Damascus was at the Monastery of St. Saba, near Jerusalem.

"Discovery of the manuscript with its pictures confirms the tradition that John of Damascus was really the person who codified Byzantine music into the form in which we have it today."

Since the illustrations were obviously included at the time the text was made, Prof. Friend points out, the manuscript reveals that John of Damascus encouraged Byzantine painting of religious figures, in the face of iconoclasts who opposed images. This theological battle, which John of Damascus is known to have waged with the iconoclasts, thus led him to preserve many ancient pictures which would otherwise be unknown.

One other great hymn book, combining pictures and music, has pointed to this significant role played by John of Damascus in Byzantine art and music. This book is in possession of the Monastery of St. Catherine on Mount Siani.

The Princeton expedition obtained 2,500 pictures, including many manuscripts which the Mt. Athos monasteries permitted photographed for the first time, and some manuscripts never before shown to scholars from outside.

The pictures will be used in the exhaustive index of Christian art on which Princeton research workers have been engaged for more than 20 years.

Science News Letter, May 22, 1937

BOTANY—ROENTGENOLOGY

New Beauty

Penetrating X-Rays Search Out Previously Undiscovered Grace and Delicacy in Shadow Photographs of Flowers

By DR. FRANK THONE

See Front Cover

X RAYS have been used for a number of things since the turn of the century when they first found employment in searching out bullets and broken bones in the frame of suffering humanity. Dentists seized upon them eagerly. Plumbers use them to hunt for lost pipes in old houses; machinists and metal workers to show up hidden flaws. Archaeologists X-ray mummies before they unwrap them. Prison wardens find saws and files with them, hidden in innocent-looking gift packages sent to prisoners. X-rays aid customs officers in thwarting would-be smugglers. The catalog of applications of X-rays has become almost endless.

And now they invade the field of art, as instruments for a new expression of beauty hitherto hidden in the heart of things. X-ray photographs of flowers are being made by a very few persons at present, but it is safe to venture the guess that once the possibilities of this relatively new medium are better understood there will be a whole school of X-ray artists. We may even live to see schisms and controversies—classicists and romantics, realists, modernists, super-extra-ultra-futurists, all having a grand time arguing with each other as they do in the already established fields of art.

Few in Field

But at present the artist's task of finding beauty and bringing it to the eyes of the world is entrusted to the hands and heads of too few X-ray pioneers to permit time or give cause for such rivalries. They all have plenty to do, opening up the great new field of X-ray art. Plenty of work, and plenty of recognition for all, as yet.

Prominent in the ranks of X-ray artists is a young California woman, Miss Francis Mildred Davis, of Santa Monica. Miss Davis earns her living with the X-ray, too, in a medical and dental consultant practice. Of course, there's nothing uncommon in this pulling of two bows with one string: many a cartoonist paints in oils on the side; many a journalist writes novels or plays — successfully, too. It's all a matter of making full use of the particular skill you have learned.

Miss Davis did not start as an X-ray technician. Her first experiences were as a photographer. But with surface photography she couldn't get everything she wanted, especially in pictures of flowers. So she learned X-ray technique, and eventually set herself up in practice. On the side, she kept up her artistic enterprises—and a lot of things besides.

Telling of her experiences to a group of businesswomen, she said: "It was a lot of fun going into business for myself and owning my own X-ray machine. I could play all I wanted to and look through anything I happened to get curious about—why my fountain pen would not work, if my new dress were pure silk or had a 'filler,' how a snake could swallow something larger than itself, was my girl friend's engagement ring genuine or glass, how many kittens was the cat going to have and was my golf score ruined because the ball's core was off center."

Flowers First

But always her interest remained with her first love, the flowers. The calm beauty of the Easter lily, the exotic delicacy of an orchid, the fantastic thick joints of a cactus contrasting with the ethereal, almost ghostly, loveliness of its blooms—these were the things she judged with swift and discriminating eye, and transferred to photofilm in new guise by means of the penetrating rays from her tubes.

The medium, like all artistic media, has its own necessary conventions. All X-ray pictures are like shadows on the wall—they are silhouettes. With an ordinary camera you take the light as it is reflected back to your lens from the subject, and so can picture things in the round—a whole group of people, a whole basket of flowers. But with X-rays you shoot straight through your subject, and the film is on the other side. The images fall on it like shadows. So you can have no mass effects. You must use a single object, or a very few, and there must be little or no overlap. The end result has something of the perspectiveless character of an Oriental painting or mosaic.

"CANDID"

A revealing self-portrait of Miss Francis Mildred Davis

But it is not merely the selection and arrangement of the flowers or other things to be pictured that tests the skill of the X-ray artist. The arrangement of the single subject is as difficult as its placing in a group, if more than one is taken at a time.

This is evident even on the surface, for of course your flower must present a good general silhouette, just as though it were being shown in outline only. However, this is only the beginning of the matter, for if you are using X-rays you have to remember the internal structures as well, and what kind of a silhouette *they* will present when the rays project them against the exterior outline.

Difficult Subject

In X-raying an orchid Miss Davis found her skill subjected to a severe test. Orchids are about the most complicated of all flowers, both in external appearance and internal structure. (*See front cover for illustration.*)

"The orchid," she says, "looked like a big ugly spider in a front view and I was about to give it up when the sixth trial turned out with graceful lines to make a well balanced picture."

Another consideration, perhaps calling for the highest technical skill of all, is the matter of bringing out structural details. One very important factor in this, possibly the most important, is the

quality of rays used. There are rays and rays, just as in visible light there are different colors and intensities of radiation. "Hard" rays give very different effects from "soft" ones, and the length and intensity of exposure have to be adapted very carefully to the thickness and density of the plant tissue being photographed.

Cactus Poses

A particularly difficult subject from this angle was the cactus which Miss Davis X-rayed. Its leaf-like stem-joints are thick and fleshy, its flowers almost ghost-like in their delicacy, with petals wraith-thin and scores of thread-like stamens. Yet by choosing the right kind of rays and the right conditions of exposure it was possible to obtain a picture that catches the spirit of the flowers and the flesh of the stems, and even shows the central column of water-conducting vessels and its branches that run out to the stem-notches.

Somewhat on the same order, though with less wide contrast between thickness of parts, was the problem of the begonia. The petals of this flower were widely expanded and quite thin; the leaves were thickish and much tougher than the petals. Less difficult, in this matter of consistency-contrasts, were the Easter lily and the orchid already mentioned, and also the calla lily. Miss Davis was especially successful in these three with the venation of both leaves and floral envelopes.

Miss Davis has treated her own head as though it were one of her flowers, taking a profile view with the X-ray, and then giving the film special treatment where the exterior, non-bony parts had been dealt with over-severely by the quality of rays necessary to bring out the outlines of skull, teeth, neckbones, etc. She says it is her favorite portrait.

It must have taken more than a little courage, for a girl to stand herself up for such a super-candid-camera shot. But she passes the test all right. And there's another thing you can see at a glance, that isn't so easily evident from an ordinary photograph. The girl has brains!

Inside Boxes

A striking example of Miss Davis's wide-ranging curiosity about the insides of things is furnished by two pictures of a small medicine cabinet, containing rolls of bandage, an insulin syringe, and some miscellaneous bottles and boxes of medicines and pills. One picture is an ordinary photograph showing their outsides. Below is an X-ray photograph showing their insides: The adhesive tape on its spool, the syringe with its needle, the droppers in some of the bottles, etc. Striking is the view of a bar of Castile soap, which shows both sides at once; the lettering stamped in the back has to be read reversed, as a printer reads type. (See page 332 for photograph.)

X-ray photographs of plants, such as Miss Davis takes, have possibilities outside the field of art. Already botanists have shown interest in their potentialities in the study of plant development, diseases, etc. And a tree surgeon, asked to treat a tree that had already been filled with cement, requested her to take an X-ray of the trunk, as a dentist might take of a suspicious tooth, to see whether new decay were starting under the old filling.

A possibility not yet explored, in the field of X-raying plants, is the testing of imported bulbs for worms or other pests that might be hiding in them. The depredations of such forms of animal life, as well as of insects, can readily be detected in plants by means of the rays. The only other way of seeking them, in many cases, is to cut the bulb to pieces.

Bud Unfolding

More strictly scientific in its application would be the taking of series of X-ray pictures of the same bud or other plant part, as it unrolls into a flower, or opens up into a leaf, or develops into a new branch. You can see several stages of flower development in the four shown in the lily picture. (See SNL, March 27, cover.) It should be possible to show all stages of development in a single flower, by taking as many as you choose, at appropriate time intervals.

There is even the possibility of getting X-ray motion pictures of such a development, though this would be unusually difficult. Since all X-rays are shadow-pictures, taken full size of the object, only very small plant parts could be "shot" directly on the frames of motion picture film. But if anyone wanted to take the pains (and go to the expense) of first making an X-ray picture at full size every few minutes during the opening of a flower, and then photographing these pictures, one by one, on a movie film, a picture could be obtained that would really be something new under the sun. It would be a film of real scientific value as well as a work of art of high and unique beauty.

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Science News Letter, May 22, 1937

THE BEGONIA

An old favorite potted plant in a new aspect.

The word bird comes from Anglo-Saxon bridd, and was originally the brood or young of any animal—wolf cubs, for instance, being wolf-birdis.

OUTSIDE AND INSIDE

A shelf of medical sundries, such as might be found in almost any household, and the same shelf, as the X-ray sees it. Note that both sides of the bar of castile soap are visible at the same time: the lettering on the back side is reversed.

From Page 327

pig opened the box. This forced the pig to come to a decision and act on it. But the effort to do this was evidently too much for the pig and within a few days it developed neurotic symptoms. Since its whole disposition has changed and from being friendly and docile it became morose and hostile.

Because the pig or sheep has a simple way of life, uncomplicated and unobscured by the ethical standards and social traditions of human life, it provides an ideal test subject, Dr. Liddell pointed out, for analyzing the essential conditions that produce nervous strain and derangement.

Use Little of Brain

The very small part of man's relatively large brain necessary for intellectual processes, or what is commonly called thinking, was described by Dr. Leland B. Alford of St. Louis.

This might be called the seat of the intellect or the brain center for thought except that such psychological terms have gone out of fashion. It is located, in right-handed persons, at the center of the left side of the brain.

Any other part of the brain can be injured or removed without interfering with intellectual processes, Dr. Alford and other scientists have found. Dr. Alford illustrated this point with several case histories, among them that of a 60-year-old business man. Apoplexy left this man almost completely paralyzed and unable to speak except for one expression of two words and the ability to swear when angry. In spite of this, the patient for two years has been conducting his business and managing several farms through an agent who is able to make out the patient's incoordinated gestures. Although the patient could not write his name upon request, he recently drew a plot of some farms without error. His mentality is excellent, Dr. Alford said, though X-ray pictures show a large part of his brain has been injured.

This and several other cases show that, contrary to general opinion among psychologists, different parts of the brain are responsible for speech and for thinking or intellectual processes. The brain area concerned with speech can be injured without affecting mentality.

The cortex or outer part of the brain is not so much concerned with thinking processes as psychiatrists have believed, Dr. Alford said.

Calcium for Hallucinations

Discovery that calcium, harmless chemical normally present in the body, can be used to calm the excitement and banish the hallucinations of mental disorders was reported by Dr. R. W. Robb of the Osawatomie (Kansas) State Hospital.

Scientists have known many drugs that would produce hallucinations but very few, other than narcotics such as morphine, have been known to relieve hallucinations, Dr. Robb pointed out.

The fact that lack or deficiency of calcium in the body causes nervous irritability is well known. Dr. Robb discovered its soothing effect when he gave it to a patient in the course of certain tests he was making. This patient's improvement led him to try it in 40 other cases of long standing. All were improved by the weekly injections of calcium.

Science News Letter, May 22, 1937

Soviet health officials are to study medical lore of India and Tibet, to see whether certain native remedies may have scientifically sound value.

RADIO

Hope to Predict Radio Conditions in Advance

HOPE that scientists will be able to predict radio transmission conditions a month or more in advance was held out by A. K. Ludy of the U. S. Coast and Geodetic Survey and A. G. McNish of the Carnegie Institution's Department of Terrestrial Magnetism. To correlate more closely the activity of the earth's magnetic field with radio transmission, these scientists are compiling a twice daily measure of the magnetic conditions as observed at seven world-wide stations. These "character figures" will be distributed by Science Service throughout the world and are expected to reveal practical useful relations between radio and earth's magnetism.

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From Page 327

electricity and repeats the process at regular intervals. Thus is produced a rapid succession of electrical pulses which are sent through a radio tube amplifier to a loud speaker. If the pulses come 256 times a second, for example, the note middle C is produced by the instrument.

The frequency of the pulses and therefore the pitch of a note is determined by the value of electrical resistance through which the condenser discharges, just as the speed of filling a water tank depends on the size of the pipe through which the water flows. Movement of the fingers on the strips atop the little instrument box changes the electrical resistance and, hence, the tone produced.

"Admittedly," said Dr. Danforth, "no electrical device at present available can imitate all the effects available in conventional instruments. But electrical systems can simulate these effects and, moreover, can produce effects which the conventional instruments cannot. Among these are unlimited volume, unlimited range of pitch, wide variations in timbre and sensitivity of the instrument to a very light touch. Acceptance of these features must await the day when trained composers are moved to weave them into artistic creations."

Science News Letter, May 22, 1937

Guatemala plans to use airplanes to spray banana plantations.

The decimal system was used in India about 2,700 B. C., judging by discovery of a regularly marked measure.

MEDICINE

Beriberi, Masked as Heart Disorder, Occurs in U. S.

Better Outlook for Bacterial Endocarditis Seen; Nervous Predisposition to Hypertension Inherited

BERIBERI, serious dietary disease of the Orient, occurs also in the United States, Dr. Soma Weiss of Boston City Hospital declared at the meeting of the American College of Physicians in St. Louis.

Beriberi comes from living on a diet that lacks vitamin B. Medical scientists have always thought that it was limited to Oriental countries and that its chief effect was on the nerves, as shown by the development of polyneuritis and mental disorder.

Occurrence of beriberi in the United States has escaped recognition, it appears from Dr. Weiss' report, because the disease has masqueraded as or been mistaken for disorder of the heart and blood circulation. The disease, contrary to general opinion, is actually relatively common in the United States, Dr. Weiss and his associate, Dr. Robert W. Wilkins, conclude.

Alcohol plays a part in causing the condition, but is secondary to lack of vitamin B in the diet.

Careful study of 120 patients suffering from symptoms of heart and blood vessel disease showed the cause of their ailment to be faulty nutrition, or as the scientists say, nutritional deficiency. The condition is not one of simple starvation, but is induced by the following factors: Low intake or utilization of vitamin B_1; high metabolism of the body such as occurs through increased caloric intake, through fever, muscular work, pregnacy or hyperthyroidism; a diet rich in carbohydrates or in alcohol. In the northeastern part of the country the disease occurs principally among alcoholics, diabetics, food cranks and pregnant women. In its pure form it develops in persons without organic heart disease. In patients with organic heart disease and with the types of nutritional deficiency described failure of the heart is often precipitated or aggravated. The onset may be gradual or sudden, leading rapidly to severe disintegration of the circulation, which, if untreated, may end fatally.

The usual clinical features include rapid heart rate, palpitation, heaving cardiac impulse, enlarged heart, shortness of breath, attacks of asthma, engorgement of the veins and transient heart murmurs.

Rapid and dramatic recovery with disappearance of all the abnormal changes in the heart and blood vessels follows treatment by rest and diet rich in vitamin B or doses of the crystalline vitamin B_1. If the condition has gone so far, however, that the structure of the heart and blood vessels has been altered, improvement is slow and incomplete.

Acidosis Remedy

Lactic acid, best known from its occurrence in sour milk and sauerkraut, has proved a "very safe and effective" remedy for severe acidosis, Dr. Alexis E. Hartmann, of Washington University School of Medicine, reported.

Mixtures of lactic acid and the related sodium lactate have proved valuable in controlling acidity of the stomach and are of particular value in treating urinary infections in infants and young children.

Dr. Hartmann was discussing a kind of acidosis that is much more severe than the condition that drives the layman to the family medicine chest for a dose of sodium bicarbonate.

Better Outlook

The outlook for the severe heart disease called bacterial endocarditis may not be so grave as generally supposed, it appears from studies reported by Dr. Louis Hamman of Johns Hopkins University School of Medicine.

Ordinarily this condition, which is an inflammation of the heart lining following a germ infection, is considered hopeless, Dr. Hamman pointed out. When the condition is well developed very, very few patients recover.

More patients actually do recover than would be suspected from the records in doctors' offices, Dr. Hamman found from careful study of anatomical specimens. Not infrequently cases of this disease are discovered at post mortem examination which had not been recognized during the patient's life. In some of the examinations Dr. Hamman found that the bacterial infection had been well on the way to healing before the patient died. In other cases healing had actually taken place. The condition had probably not been recognized during the patient's life because the symptoms were so slight as to escape notice.

Blood Pressure Inherited

High blood pressure, or more accurately a nerve set-up conducive to it, is very probably inherited, Dr. Edgar A. Hines, Jr., of the Mayo Clinic told the members of the American College of Physicians.

An ice water test which indicates that a person is likely to develop high blood pressure gave strong evidence that an hereditary factor plays an important role in the development of high blood pressure, Dr. Hines reported. The high blood pressure he studied is known to doctors as essential hypertension and is the kind that is not preceded by kidney disease.

The ice water test, called the "cold pressor test," consists in measuring the rise in blood pressure produced by the stimulus of placing one hand in ice water. It was devised by Dr. Hines and the late Dr. George E. Brown. It divides people into two groups; those having normal or minimal reactions (slight rises in blood pressure), and those having abnormal or excessive reactions. Almost all persons with high blood pressure belong in the latter group of excessive reactors.

One other group of persons who do not have high blood pressure give excessive reactions to the test, and these are the ones likely to develop high blood pressure in the future. A few of them have already done so since the ice water test was first used five years ago.

In the study of inheritance of high blood pressure, Dr. Hines gave the ice water test to 600 persons with normal pressure, 10 sets of twins and 250 members of 30 family groups consisting of from two to four generations. Comparing the results with family histories, Dr. Hines found a family history of high blood pressure five times as frequently among persons who reacted abnormally to the ice water test as among normal reactors.

Science News Letter, May 22, 1937

When moving picture actors have irregular teeth, a perfect line is artificially produced by porcelain facings or jackets.

PHYSIOLOGY

NATURE RAMBLINGS by Frank Thone

Tellurium

SELENIUM, "moon-element," chemical relative of sulphur, has been convicted of serious harm to animals that have eaten plants grown on soil containing it, and at least the suspicion of causing like harm to human beings has been lodged against it.

Tellurium, another member of the same chemical cousinship, is known to occur in soils in some parts of the United States, so the question naturally arose, whether this element also had in it selenium-like potentialities of harm.

Report of comparative experiments on plants and animals with salts of selenium and tellurium is made by Alan L. Martin, of the botany department of Columbia University, in the current issue of the *American Journal of Botany*.

Mr. Martin grew series of plants in jars of water containing various concentrations of salts of both elements. Both proved injurious above certain threshold levels, but selenium caused far greater injury than tellurium at any given solution concentration. Sulphur, known to be able to inhibit the absorption of selenium by plants, seemed to have no such antagonism for tellurium. On the contrary, plants in tellurium solutions suffered more when sulphur was added.

The critical test came when plant food grown on soils to which 32 parts per million of tellurium and selenium, respectively, had been added were fed to rats. Food from the selenized soil sickened the rats very soon, and killed them within two weeks. Rats fed on food from the artificially tellurized soil, on the contrary, showed no particular ill effects. They did not grow quite so rapidly as "control" rats fed on a diet free from both selenium and tellurium, but their health remained apparently normal.

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PSYCHOLOGY

Fail to Recognize Voices After 5-Month Period

German Accent Does Not Help; Two Electric Circuits In Brain Described to Midwestern Psychology Meeting

THE chances are only 13 out of a hundred that a person would recognize an unfamiliar voice after an interval of five months, psychologists learned from a report of experiments conducted at Johns Hopkins University by Dr. Frances McGehee and presented to the Midwestern Psychological Association at Urbana, Ill.

Ability to identify voices positively, a controverted issue in many court cases and emphasized particularly by the evidence in the trial of Hauptmann for kidnapping the little Lindbergh baby, was tested by Dr. McGehee.

The persons tested, including a group of law students, listened to a voice behind a screen reading a selection of 56 words. Later they were required to pick out that voice from a group of five reading the same selection under the same circumstances. The time interval between the readings varied from one day to five months.

An unfamiliar voice was recognized by 83 per cent. of the listeners after two days. When two weeks had elapsed, memory for the voice decreased. After three months only 35 per cent. could pick it out; after five months only 13 per cent. could identify it correctly.

A foreign accent (German) did not aid the listeners in identifying the voice. In one of the experiments, a German student who had been in the United States only six months was used as the first speaker. After the time interval this voice was again heard with other voices, respectively Chinese, Greek, another German, and a Russian. The voice most frequently confused with the German voice was not the other German, but the Chinese.

The German accent was not always recognized as that; it was also called Japanese, Norwegian, Dutch, Jewish, Assyrian, Polish-Russian, Swedish, Russian with French influence, and Spanish.

"The reliability of court procedure in accepting testimony of positive identification of a defendant by his voice, in consideration of the length of time interval and the common fallibility of memory, would seem to be relatively low in the light of the present experiments," Dr. McGehee concluded.

Two Circuits in Brain

The brain has two more or less independent circuits of electrical activity. One deals with the rush of messages that flow from the senses to the brain and out again to the muscles. The other —undisturbed by this contact with the world of the senses—is the background which, with other parts of the nervous system, provides the stuff of consciousness itself.

This is the theory proposed by Drs. S. H. Bartley and Peter Heinbecker of the Washington University School of Medicine, St. Louis, as a result of their experiments with brain waves, those electrical impulses that can be led off direct from the brain.

Because it is impossible to isolate for study any single cell or nervous element in the live working brain, a new technique was devised by these investigators for observing their action indirectly.

Tiny needle electrodes, insulated except at the very tip, were placed in pairs at various depths of the brain's cortex. This outer shell of the brain, which contains a number of layers of cells and their tree-like connections, is of special

RADIO

May 25, 4:15 p. m., E.S.T.
STAINED GLASS — ART AND SCIENCE
—Lawrence Saint, well-known artist of Philadelphia.

June 1, 4:15 p. m., E.S.T.
SEA SERPENTS AGAIN—Dr. Paul Bartsch of the U. S. National Museum.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

interest to psychologists, for it is there that nerve activity attains its highest complexity.

The brain waves led off from each of these various layers of the cortex were then compared with others and also with records on the same layer when a very small amount of strychnine was applied to the surface of the cortex just over the needles.

Strychnine changes the nervous activity in the brain so that the brain wave patterns are something like those from the outside of the head of humans in an epileptic seizure. This is unlike the normal rhythm, and has been likened to static of a nervous thunderstorm.

The strychnine does not affect the other "circuit" of the brain which has another pattern of electric impulses known to scientists as the "beta rhythm." This rhythm flows on undisturbed except by very deep anesthesia.

By recording in this way the effect on the brain rhythms of strychnine applied locally, the activity of different groups of cell masses has been deduced, Dr. Bartley told his colleagues.

Group Judgment Best

Scientific support for the old saying that "two heads are better than one" was presented by Dr. Herbert Gurnee, of Western Reserve University.

Individual judgments were obtained by Dr. Gurnee on the truth or falsity of various statements and also a group judgment as represented by a majority vote.

The group judgment, in terms of correct answers, was not only better than that of the average member, it was equal to the judgment of the best member of the group.

Family Discord

A give and take spirit between the parents is essential to the family happiness of the children, Dr. Edmund S. Conklin, of Indiana University, told the meeting.

Among those persons living in a family where one or the other parent "rules the roost," discordance in the family group is twice as great as it is where neither one is dominant. And this holds true regardless of whether the father or mother runs things.

Family discord seems to run in families, Dr. Conklin found. Those whose parents had much trouble with their relatives reported more unhappiness than those whose parents did not have family troubles.

Marital Agreement

Do husbands and wives agree in their attitudes toward political, economic, religious and other questions? This question was raised at the meeting by Dr. Ross Stagner, of the University of Akron, who has made an attempt to test the traditional assumption that married couples are similar or grow to be alike psychologically.

The extent to which husband and wife agree depends upon the particular question involved, Dr. Stagner found, although it is difficult to figure out any system to account for the degree of agreement. If the issues are particularly controversial, that may lead either to greater disagreement or more unanimity.

Particular questions on which there is greatest marital agreement in either joint approval or disapproval are represented by these terms: Republican, Methodist, Big Navy and Nazi. Those on which there is least agreement are: censorship, child labor and spiritualist.

Some couples do agree "in general" on most matters, Dr. Stagner found. He added the suggestion that this might be caused by the fact that one of the pair dominates the other, an interesting subject for "case-study" investigation.

Vocabulary Large

Aiguillette, dyad, Geez, kainite, pratique, villanella, whitrack. These are just a few words picked at random from an abridged dictionary in common use. But such a dictionary does not contain enough words to indicate all those that can be recognized and used by the modern 1937 model college student, Drs. Robert H. Seashore and Lois Eckerson, of the University of Southern California, told the meeting.

To make an adequate test for these verbally fluent students, these investigators found it necessary to make a generous sampling of the Funk and Wagnalls' 1936 unabridged dictionary which holds more than 450,000 words.

"The data indicate that the average size of English vocabulary is far larger than most previous estimates," they concluded.

Those adopting a baby should not place too much importance on the intelligence of the infant's parents, Dr. Donald Snygg, of the University of Toronto, reported.

Intelligence test scores of 300 children in supervised foster homes were compared by Dr. Snygg with the IQ's of their true mothers. Some relation was found, but it was very slight. Eliminating those who had been cared for by their own mothers during early childhood reduced even more the relation between mother's score and the baby's rating.

A surprising finding was that the children of mothers who were borderline in intelligence turned out actually slightly superior to the children of mothers with average normal mentality. Those of definitely subnormal parents, however, averaged slightly lower.

Science News Letter, May 22, 1937

Forsythia bushes, with their long branches loaded with yellow blossoms, were first introduced to European gardens from China, in 1844.

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Zoology, Juvenile

THE BIOGRAPHY OF AN ARCTIC FOX—Ernest Thompson Seton—*Appleton-Century*, 126 p., ill., $2. A story of a small life—two lives—on a rugged Arctic island, told and illustrated in typical Setonian manner.

Science News Letter, May 22, 1937

Psychology

WHAT IT MEANS TO GROW UP, A GUIDE IN UNDERSTANDING THE DEVELOPMENT OF CHARACTER—Fritz Kunkel—*Scribner*, 180 p., $2.. An English translation by Barbara Keppel-Compton and Hulda Niebuhr of a German work by a member of the International Society for Individual Psychology, who is also a practicing specialist for nervous diseases in Berlin. The book is intended for parents and teachers.

Science News Letter, May 22, 1937

Health and Hygiene

PHYSIOLOGICAL HYGIENE — Cleveland Pendleton Hickman—*Prentice-Hall*, 493 p., $3.25. In this text for college students, physiology and the basic causes of disease are presented to give the student fundamental knowledge for healthy living.

Science News Letter, May 22, 1937

Medicine

TRAUMA AND DISEASE—Leopold Brahdy and Samuel Kahn, eds.—*Lea & Febiger*, 613 p., $7.50. Twenty-four eminent physicians have contributed to this symposium which should prove extremely helpful to physicians in medico-legal cases.

Science News Letter, May 22, 1937

Exploration

MY JUNGE TRAILS—A. Hyatt Verrill—*L. C. Page*. 329 p., $3.50. Travels and thrills, in lands around the Caribbean, by one who has been up many rivers and over many trails. The author doesn't like to glorify himself by exaggerating his hardships, and he even makes humor out of many of them.

Science News Letter, May 22, 1937

Histology

HANDBOOK OF MICROSCOPICAL TECHNIQUE FOR WORKERS IN ANIMAL AND PLANT TISSUE (2d ed. rev. and enlarged)—C. E. McClung, ed.—*Hoeber*, 698 p., $8. Dr. McClung has long been recognized as an authority in histological methods, and after the success of the first edition of his book the second surely needs no bush. He has taken advantage of the need of this new edition to include some of the new advanced technique, particularly in the manipulation of living material and in refinements of optical methods.

Science News Letter, May 22, 1937

Pediatrics

CHILDREN HANDICAPPED BY CEREBRAL PALSY, PSYCHOLOGICAL FACTORS IN MANAGEMENT—Elizabeth Evans Lord—*Commonwealth Fund*, 105 p., $1.25. This book is of special interest to psychologists, teachers and parents of children handicapped by cerebral palsy. The material is based on experience with more than 300 such patients, and is presented in a simple, practical way that should do much to help in the education and training of the thousands of such patients found all over the country.

Science News Letter, May 22, 1937

Economics

WAGES, HOURS AND EMPLOYMENT IN THE UNITED STATES, 1914-1936 — M. Ada Beney—*Nat. Industrial Conference Board*, 197 p., tables, $3.50. A statistical study covering an important period of the United States' industrial history.

Science News Letter, May 22, 1937

Child Training

CHILDREN IN THE FAMILY—Harold H. Anderson—*Appleton-Century*, 253 p., $2. A former member of the staff at the Iowa Child Welfare Research Station, now at the University of Illinois, writes this book for parents dealing with the care and training of the normal child at home.

Science News Letter, May 22, 1937

Psychology

HEALTHY GROWTH, A STUDY OF THE INFLUENCE OF HEALTH EDUCATION ON GROWTH AND DEVELOPMENT OF SCHOOL CHILDREN—Martha Crumpton Hardy and Carolyn H. Hoefer—*Univ. of Chicago*, 360 p., $3.50. This investigation of some 400 boys and girls in Joliet, Illinois, over a twelve-year period, is an attempt to evaluate health education in its effect on growth and development.

Science News Letter, May 22, 1937

Zoning

ZONING, THE LAWS, ADMINISTRATION, AND COURT DECISIONS DURING THE FIRST TWENTY YEARS—Edward M. Bassett—*Russell Sage Foundation*, 275 p., $3. This is a book of particular interest to city planners and those with civic responsibilities.

Science News Letter, May 22, 1937

Agricultural Economics

THREE YEARS OF THE AGRICULTURAL ADJUSTMENT ADMINISTRATION — Edwin G. Nourse, Joseph S. Davis, John D. Black—*Brookings*, 600 p., $3.50. An historical document, telling fully but concisely of the first effort in the United States to take agriculture out of complete (and what appeared to be self-destructive) individualism and to place it on a basis of nationally planned cooperation. Factors contributing to successes and failures are analyzed as carefully as data now available permit. This study should reach a peak of usefulness if the legal situation in this country should ever permit a new effort toward a deliberately planned national agricultural economy, and the economic and social situation make such an effort appear desirable.

Science News Letter, May 22, 1937

Agricultural Economics

FARM TENANCY; REPORT OF THE PRESIDENT'S COMMITTEE—National Resources Committee—*Govt. Print. Off.*, 108 p., 30c. See page 328.

Science News Letter, May 22, 1937

Education

GIVE YOURSELF BACKGROUND—F. Fraser Bond—*Whittlesey*, 218 p., $2. This book is not one of those guaranteed to provide you with a glamorous personality, or conversation that will impress your dinner guest. It does provide worthwhile suggestions for making life more worth the living, and for adapting to this purpose those cultural media that are within the reach of all.

Science News Letter, May 22, 1937

Juvenile Recreation

PLAY STREETS AND THEIR USE FOR RECREATIONAL PROGRAMS — Edward V. Norton—*A. S. Barnes*, 77 p., $1.

Science News Letter, May 22, 1937

Psychology

THINK FOR YOURSELF—Robert P. Crawford—*Whittlesey House*, 250 p., $2.50. An interesting feature of this readable book is the placing, here and there throughout it, of blank pages on which the reader may record his own thoughts. The author is assistant to the Chancellor at the University of Nebraska.

Science News Letter, May 22, 1937

Chemistry

ELEMENTARY CHEMISTRY—Douglas G. Hill, John H. Saylor, Warren C. Vosburgh and Robert N. Wilson—*Holt*, 473 p., $2.80. Note correction in price.

Science News Letter, May 22, 1937